1885 S. Arlington Ave., Suite 111 Reno, Nevada 89509 (775) 329-4955

Date	Date 7/29/2011							
Engineer	Engineer Jack Norberg							
Project	Homewood	l Mountain Res	ort - Summer	Calculations				
Watershed	ProposedC	onditions WS-2	2					
Area (acres)	42.4	Elevation (ft)	6645	Return Period (years)		100		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.27	0.4			12.63		
Collector 1	1853	0.33	0.1	28.2	15	3.12		
Collector 2	1344	0.05	0.04	33.7	15	2.30		
Collector 3	707	0.01	0.025	38.1	1	1.09		
				Total Response	Time (minutes)	19.15		
		action for a substitution of the		Unit Peak	Flow (cfs/acre)	1.55		
			Infiltra	ation Rate (in/hr)	0.26			
	Infiltration Factor (cfs/acre) 0.32							
			Per	cent Impervious	18.2			
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x nfiltration Factor					49.02		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

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		Oman wat	oronica i o	an i ion iion	tonioot.			
Date	7/29/2011	9/2011						
Engineer	Jack Norbe	erg						
Project	Homewood	Mountain Res	ort - Summer	Calculations				
Watershed	Proposed C	Conditions WS-	3					
Area (acres)	10.0	10.0 Elevation (ft) 6593 Return Period (years) 100						
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.18	0.4			14.36		
Collector 1	1647	0.30	0.1	8.6	15	3.86		
Collector 2	581	0.07	0.11	9.2	1	1.52		
Collector 3								
				Total Response <sup>-</sup>	Time (minutes)	19.74		
				Unit Peak	Flow (cfs/acre)	1.50		
			Infiltre	ation Rate (in/hr)	0.27			
			Infiltration F	Factor (cfs/acre)	0.33	8		
			Per	cent Impervious	11.5			
Watershed Pea Infiltration Facto		): Area x Unit	Peak Flow-(1-	-Percent Impervio	ous) x Area x	11.12		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

1885 S. Arlington Ave., Suite 111 Reno, Nevada 89509 (775) 329-4955

		Oman wat	cisiled re	ak i low work	Silect			
Date	Date 7/29/2011							
Engineer	Jack Norbe	Jack Norberg						
Project	Homewood	l Mountain Res	ort - Summer	Calculations				
Watershed	Proposed (	Conditions WS-	4					
Area (acres)	67.4	Elevation (ft)	6652	Return Period (years)		100		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.18	0.4			14.26		
Collector 1	2448	0.26	0.1	57.5	15	3.81		
Collector 2	1456	0.04	0.02	64.8	3	0.93		
Collector 3								
			College and College	Total Response	Γime (minutes)	19.00		
				Unit Peak	Flow (cfs/acre)	1.58		
			Infiltra	tion Rate (in/hr)	0.51			
			Infiltration F	actor (cfs/acre)	0.62			
			Per	cent Impervious	7.6			
Watershed Pea Infiltration Facto		): Area x Unit	Peak Flow-(1-	Percent Impervio	ous) x Area x	65.34		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

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(775) 329-4955

Date	Date 7/29/2011							
Engineer Jack Norberg								
Project	Homewood	l Mountain Res	ort - Summer	Calculations	San Tanana and Andrews Market Comments			
Watershed	Proposed (	Conditions WS-	5					
Area (acres)	5.4	Elevation (ft)	7408	Return Period (years)		100		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.19	0.4			14.04		
Collector 1	631	0.22	0.1	4.8	3	1.32		
Collector 2	The or Vice is							
Collector 3								
				Total Response	Time (minutes)	15.36		
		The state of the s		Unit Peak	Flow (cfs/acre)	1.75		
			Infiltra	ation Rate (in/hr)	0.22			
			Infiltration I	Factor (cfs/acre)	0.26			
			Per	cent Impervious	20.4			
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x Infiltration Factor					7.47		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

1885 S. Arlington Ave., Suite 111 Reno, Nevada 89509

(775) 329-4955

Date	Date 7/29/2011						
Engineer	Engineer Jack Norberg						
Project	Homewood	Mountain Res	ort - Summer	Calculations			
Watershed	Proposed C	Conditions WS-	6				
Area (acres)	2.2	2.2 Elevation (ft) 7565 Return Period (years)				100	
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)	
Overland Flow	180	0.32	0.4			6.52	
Collector 1	376	0.30	0.22	2.2	3	1.54	
Collector 2							
Collector 3							
				Total Response	Time (minutes)	8.06	
				Unit Peak	Flow (cfs/acre)	2.50	
			Infiltra	ation Rate (in/hr)	0.23		
	Infiltration Factor (cfs/acre) 0.28						
			Per	cent Impervious	5.9		
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x  nfiltration Factor					5.00	

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

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		Siliali Wat	ersneu re	ak i low work	Concet	
Date	7/29/2011					
Engineer	Jack Norbe	erg				
Project	Homewood	l Mountain Res	ort - Summer	Calculations		
Watershed	Proposed (	Conditions WS-	7			
Area (acres)	145.7	Elevation (ft)	7465	Return Period (years)		100
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)
Overland Flow	500	0.18	0.4			14.26
Collector 1	4308	0.27	0.1	145.7	15	5.24
Collector 2						
Collector 3						
				Total Response	Time (minutes)	19.50
				Unit Peak	Flow (cfs/acre)	1.70
			Infiltra	ition Rate (in/hr)	0.28	
			Infiltration F	actor (cfs/acre)	0.33	
			Per	cent Impervious	1.2	
Watershed Pea Infiltration Facto		): Area x Unit	Peak Flow-(1	Percent Impervio	ous) x Area x	199.91

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

<b>Preliminary</b>	Drainage	Report

Homewood Mountain Resort

<u>December 2010</u> Placer County, California

Winter

1885 S. Arlington Ave., Suite 111 Reno, Nevada 89509 (775) 329-4955

		Oman wat	cronca i c	ak i low worr	Correct			
Date	7/29/2011	/29/2011						
Engineer	Jack Norbe	ack Norberg						
Project	Homewood	Mountain Res	ort - Winter C	alculations				
Watershed	Existing Co	onditions WS-1						
Area (acres)	28.3	Elevation (ft)	6702	Return Period (years)		10		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	516	0.23	0.4			13.46		
Collector 1	1942	0.38	0.1	20.7	15	3.36		
Collector 2	369	0.18	0.05	25.3	15	0.48		
Collector 3	221	0.02	0.05	28.3	1	0.37		
	V HA			Total Response	Time (minutes)	17.67		
		13 11		Unit Peak	Flow (cfs/acre)	0.91		
			Infiltra	ation Rate (in/hr)	0.17			
	Infiltration Factor (cfs/acre) 0.21							
			Per	cent Impervious	90			
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x nfiltration Factor				25.12			

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

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		Siliali Wal	ersned Pe	ak Flow Worl	Ksneet	
Date	7/29/2011					
Engineer	Jack Norbe	erg				
Project	Homewood	Mountain Res	ort - Winter C	alculations		
Watershed	Existing Co	onditions WS-2				
Area (acres)	42.4	42.4 Elevation (ft) 6645 Return Period (years)				
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)
Overland Flow	500	0.27	0.4			12.63
Collector 1	1853	0.33	0.1	28.2	15	3.12
Collector 2	824	0.07	0.1	37.3	3	1.56
Collector 3	305	0.01	0.05	42.4	1	0.56
Collector 4						
				Total Response	Time (minutes)	17.88
				Unit Peak	Flow (cfs/acre)	0.91
			Infiltra	ition Rate (in/hr)	0.23	
	Infiltration Factor (cfs/acre) 0					
			Per	cent Impervious	90	
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x nfiltration Factor					37.38

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

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		Oman wat	ersnear e	ak i low work	Concet		
Date	Date 7/29/2011						
Engineer	neer Jack Norberg						
Project	Homewood	l Mountain Res	ort - Winter C	alculations			
Watershed	Existing Co	onditions WS-3					
Area (acres)	10.0	Elevation (ft)	6593	Return Period (years)		10	
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)	
Overland Flow	500	0.18	0.4			14.36	
Collector 1	1715	0.30	0.1	8.6	15	4.05	
Collector 2	280	0.12	0.02	10.0	3	0.18	
Collector 3							
				Total Response <sup>-</sup>	Time (minutes)	18.60	
				Unit Peak	Flow (cfs/acre)	0.91	
			Infiltra	ition Rate (in/hr)	0.34		
			Infiltration F	actor (cfs/acre)	0.41		
			Per	cent Impervious	90		
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x nfiltration Factor				8.72		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

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		Oman was	oronou r o	unt 1 1011 11 011	(Olloot		
Date	7/29/2011	7/29/2011					
Engineer	Jack Norbe	erg					
Project	Homewood	Mountain Res	ort - Winter C	alculations			
Watershed	Existing Co	onditions WS-4					
Area (acres)	67.4	Elevation (ft)	6652	Return Period (years)		10	
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)	
Overland Flow	500	0.18	0.4			14.26	
Collector 1	2448	0.26	0.1	57.5	15	3.81	
Collector 2	1456	0.04	0.02	67.4	3	0.92	
Collector 3							
				Total Response	Time (minutes)	18.99	
				Unit Peak	Flow (cfs/acre)	0.90	
			Infiltra	tion Rate (in/hr)	0.51		
			Infiltration F	actor (cfs/acre)	0.62		
			Per	cent Impervious	90		
and the second of the second o	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x infiltration Factor				56.45		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

1885 S. Arlington Ave., Suite 111 Reno, Nevada 89509

(775) 329-4955

Date	ate 7/29/2011							
Engineer	Engineer Jack Norberg							
Project	Homewood	l Mountain Res	ort - Winter C	alculations				
Watershed	Existing Co	nditions WS-5						
Area (acres)	5.4	5.4 Elevation (ft) 7408 Return Period (years)						
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.19	0.4			14.04		
Collector 1	616	0.23	0.1	5.4	15	1.81		
Collector 2								
Collector 3								
				Total Response	Time (minutes)	15.85		
				Unit Peak	Flow (cfs/acre)	1.10		
			Infiltra	tion Rate (in/hr)	0.26			
			Infiltration F	actor (cfs/acre)	0.31			
			Per	cent Impervious	90			
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x nfiltration Factor					5.79		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

1885 S. Arlington Ave., Suite 111 Reno, Nevada 89509

(775) 329-4955

	•	Oman was	cronica i ci	ak i iow won				
90	7/29/2011	29/2011						
Engineer	Jack Norbe	erg						
Project	Homewood	Mountain Res	ort - Winter C	alculations				
Watershed	Existing Co	nditions WS-6						
Area (acres)	2.2	Elevation (ft)	7565	Return Period (years)		10		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	100	0.30	0.4			4.66		
Collector 1	401	0.07	0.1	2.2	15	2.32		
Collector 2								
Collector 3								
				Total Response	Time (minutes)	6.98		
				Unit Peak	Flow (cfs/acre)	1.50		
			Infiltra	ation Rate (in/hr)	0.26			
			Infiltration I	actor (cfs/acre)	0.31			
			Per	cent Impervious	90			
and the same of th	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x nfiltration Factor							

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

1885 S. Arlington Ave., Suite 111 Reno, Nevada 89509 (775) 329-4955

		Siliali Wal	ersneu re	ak Flow Woll	ASHEEL		
Date	7/29/2011						
Engineer	Jack Norbe	erg					
Project	Homewood	l Mountain Res	ort - Winter C	alculations			
Watershed	Existing Co	onditions WS-7					
Area (acres)	145.7	Elevation (ft)	7465	Return Period (years)		10	
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)	
Overland Flow	500	0.18	0.4			14.26	
Collector 1	4308	0.27	0.1	145.7	15	5.24	
Collector 2							
Collector 3							
				Total Response	Time (minutes)	19.50	
				Unit Peak	Flow (cfs/acre)	1.00	
			Infiltra	tion Rate (in/hr)	0.28		
	Infiltration Factor (cfs/acre) 0.33						
			Per	cent Impervious	90		
Watershed Pea Infiltration Factor		): Area x Unit	Peak Flow-(1-	Percent Impervi	ous) x Area x	140.82	

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

1885 S. Arlington Ave., Suite 111 Reno, Nevada 89509 (775) 329-4955

		Siliali Wal	ersneu re	ak Flow Wolf	(SHEEL			
Date	Date 7/29/2011							
Engineer	Engineer Jack Norberg							
Project	Homewood	l Mountain Res	ort - Winter C	alculations				
Watershed	Proposed (	Conditions WS-	1					
Area (acres)	28.3	Elevation (ft)	6702	Return Period (years)		10		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	516	0.23	0.4			13.46		
Collector 1	1942	0.38	0.1	20.7	15	3.36		
Collector 2	1051	0.06	0.025	24.5	1	0.74		
Collector 3					a divo			
				Total Response	Time (minutes)	17.56		
				Unit Peak	Flow (cfs/acre)	0.91		
			Infiltra	ation Rate (in/hr)	0.15			
			Infiltration F	actor (cfs/acre)	0.18			
			Per	cent Impervious	90			
Watershed Pea		): Area x Unit	Peak Flow-(1-	Percent Impervio	ous) x Area x	21.87		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

1885 S. Arlington Ave., Suite 111 Reno, Nevada 89509

(775) 329-4955

		Oman was		ak i low work				
Date	Date 7/29/2011							
Engineer								
Project	Homewood	l Mountain Res	ort - Winter C	alculations				
Watershed	ProposedC	onditions WS-2	2					
Area (acres)	42.4	Elevation (ft)	6645	Return Period (years)		10		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.27	0.4			12.63		
Collector 1	1853	0.33	0.1	28.2	15	3.12		
Collector 2	1344	0.05	0.04	33.7	15	2.30		
Collector 3	707	0.01	0.025	38.1	1	1.09		
	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7			Total Response	Time (minutes)	19.15		
				Unit Peak	Flow (cfs/acre)	0.89		
			Infiltra	ation Rate (in/hr)	0.26			
			Infiltration I	actor (cfs/acre)	0.32			
			Per	cent Impervious	90			
Watershed Pea Infiltration Facto	5.765 N	): Area x Unit	Peak Flow-(1	-Percent Impervi	ous) x Area x	32.65		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

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(775) 329-4955

Date	Date 7/29/2011							
Engineer								
Project	Homewood	l Mountain Res	ort - Winter C	alculations				
Watershed	Proposed (	Conditions WS-	3					
Area (acres)	10.0	Elevation (ft)	6593	Return Period (years)		10		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.18	0.4			14.36		
Collector 1	1647	0.30	0.1	8.6	15	3.86		
Collector 2	581	0.07	0.11	9.2	1	1.52		
Collector 3								
				Total Response	Time (minutes)	19.74		
				Unit Peak	Flow (cfs/acre)	0.89		
			Infiltra	tion Rate (in/hr)	0.27			
			Infiltration F	actor (cfs/acre)	0.33	<u> </u>		
			Per	cent Impervious	90			
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x nfiltration Factor							

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

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Date	Date 7/29/2011							
Engineer Jack Norberg								
Project	Homewood	Mountain Res	ort - Winter C	alculations				
Watershed	Proposed (	Conditions WS-	4					
Area (acres)	67.4	Elevation (ft)	6652	Return Period (years)		10		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.18	0.4			14.26		
Collector 1	2448	0.26	0.1	57.5	15	3.81		
Collector 2	1456	0.04	0.02	64.8	3	0.93		
Collector 3								
				Total Response	Time (minutes)	19.00		
				Unit Peak	Flow (cfs/acre)	0.90		
			Infiltra	ition Rate (in/hr)	0.51			
	Infiltration Factor (cfs/acre) 0.62							
	Percent Impervious 90							
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x nfiltration Factor							

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

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		Oman was	oronou r o	un 1 1011 11011	(011001			
Date	Date 7/29/2011							
Engineer	Engineer Jack Norberg							
Project	Homewood	l Mountain Res	ort - Winter C	alculations				
Watershed	Proposed (	Conditions WS-	5					
Area (acres)	5.4	Elevation (ft)	7408	Return Period (years)		10		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.19	0.4			14.04		
Collector 1	631	0.22	0.1	4.8	3	1.32		
Collector 2								
Collector 3								
				Total Response	Time (minutes)	15.36		
				Unit Peak	Flow (cfs/acre)	1.10		
			Infiltra	ation Rate (in/hr)	0.22			
			Infiltration I	Factor (cfs/acre)	0.26			
			Per	cent Impervious	90			
Watershed Pea Infiltration Facto	6000	): Area x Unit	Peak Flow-(1	-Percent Impervi	ous) x Area x	5.20		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

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					The state of the s			
Date	7/29/2011	29/2011						
Engineer	Jack Norbe	ack Norberg						
Project	Homewood	l Mountain Res	ort - Winter C	alculations				
Watershed	Proposed (	roposed Conditions WS-6						
Area (acres)	2.2	Elevation (ft)	7565	Return Period (years)		10		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	180	0.32	0.4			6.52		
Collector 1	376	0.30	0.22	2.2	3	1.54		
Collector 2								
Collector 3			Estative .					
				Total Response	Time (minutes)	8.06		
		The state of the s		Unit Peak	Flow (cfs/acre)	1.45		
			Infiltra	ation Rate (in/hr)	0.23			
			Infiltration F	actor (cfs/acre)	0.28			
	Percent Impervious 90							
Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x Infiltration Factor						3.18		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).
- \* The last collector area assumes a 50% reduction in the proposed development area due to stormwater runoff that is mitigated by proposed onsite stormwater infiltration devices.

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Date	7/29/2011	29/2011						
Engineer	Jack Norbe	erg						
Project	Homewood	Mountain Res	ort - Winter C	alculations				
Watershed	Proposed (	Conditions WS-	7					
Area (acres)	145.7	Elevation (ft)	7465	Return Period (years)		10		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.18	0.4			14.26		
Collector 1	4308	0.27	0.1	145.7	15	5.24		
Collector 2								
Collector 3								
				Total Response	Time (minutes)	19.50		
				Unit Peak	Flow (cfs/acre)	1.00		
			Infiltra	tion Rate (in/hr)	0.28			
			Infiltration F	actor (cfs/acre)	0.33			
			Per	cent Impervious	90			
	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x nfiltration Factor					140.86		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

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(775) 329-4955

		Oman wa	cronca i c	ak i low work	toricct				
Date	7/29/2011	29/2011							
Engineer	ngineer Jack Norberg								
Project	Homewood	l Mountain Res	ort - Winter C	alculations					
Watershed	Existing Co	nditions WS-1							
Area (acres)	28.3	Elevation (ft)	6702	Return Period (years)		100			
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)			
Overland Flow	516	0.23	0.4			13.46			
Collector 1	1942	0.38	0.1	20.7	15	3.36			
Collector 2	369	0.18	0.05	25.3	15	0.48			
Collector 3	221	0.02	0.05	28.3	1	0.37			
				Total Response	Time (minutes)	17.67			
				Unit Peak	Flow (cfs/acre)	1.65			
			Infiltra	ation Rate (in/hr)	0.17				
			Infiltration F	actor (cfs/acre)	0.21				
			Per	cent Impervious	90				
Watershed Pea Infiltration Facto		): Area x Unit	Peak Flow-(1	-Percent Impervio	ous) x Area x	46.03			

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

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(775) 329-4955

Date	7/29/2011	7/29/2011						
Engineer	Jack Norbe	ack Norberg						
Project	Homewood	d Mountain Res	ort - Winter C	alculations				
Watershed	Existing Co	onditions WS-2						
Area (acres)	42.4	Elevation (ft)	6645	Return Period (years)		100		
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)		
Overland Flow	500	0.27	0.4			12.63		
Collector 1	1853	0.33	0.1	28.2	15	3.12		
Collector 2	824	0.07	0.1	37.3	3	1.56		
Collector 3	305	0.01	0.05	42.4	1	0.56		
Collector 4								
				Total Response	Time (minutes)	17.88		
				Unit Peak	Flow (cfs/acre)	1.63		
			Infiltra	ation Rate (in/hr)	0.23			
			Infiltration F	actor (cfs/acre)	0			
			Per	cent Impervious	90			
Watershed Pea Infiltration Factor	Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x					67.90		

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

1885 S. Arlington Ave., Suite 111

Reno, Nevada 89509

(775) 329-4955

Date						
Engineer						
Project	Homewood	d Mountain Res	ort - Winter C	alculations		
Watershed	Existing Co	onditions WS-3				
Area (acres)	10.0	Elevation (ft)	6593	Return Period (years)		100
_	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)
Overland Flow	500	0.18	0.4			14.36
Collector 1	1715	0.30	0.1	8.6	15	4.05
Collector 2	280	0.12	0.02	10.0	3	0.18
Collector 3					Mark States	
				Total Response	Time (minutes)	18.60
				Unit Peak	Flow (cfs/acre)	1.50
			Infiltra	ation Rate (in/hr)	0.34	
			Infiltration F	actor (cfs/acre)	0.41	
			Per	cent Impervious	90	
Watershed Pea Infiltration Facto		): Area x Unit	Peak Flow-(1-	-Percent Impervi	ous) x Area x	14.65

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).

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		Oman wat	cronea r c	ak i low work	GIICCI	
Date	7/29/2011					
Engineer	Jack Norberg					
Project	Homewood Mountain Resort - Winter Calculations					
Watershed	Existing Conditions WS-4					
Area (acres)	67.4	Elevation (ft)	6652	Return Period (years)	100	
	Length (ft)	Slope (ft/ft)	Manning's n value	Contributing Area (acres)	Side Slope (ft/ft)	Response Time (minutes)
Overland Flow	500	0.18	0.4			14.26
Collector 1	2448	0.26	0.1	57.5	15	3.81
Collector 2	1456	0.04	0.02	67.4	3	0.92
Collector 3						
Total Response Time (minutes)						18.99
Unit Peak Flow (cfs/acre)						1.55
Infiltration Rate (in/hr) 0.51						
Infiltration Factor (cfs/acre) 0.62						
Percent Impervious 90						
Watershed Peak Flow (cfs): Area x Unit Peak Flow-(1-Percent Impervious) x Area x Infiltration Factor						100.25

- 1. Manning's n Values taken from Placer County, Storm Water Management Manual (SWMM), Table 5-5. Woods with some Underbrush Low = 0.4
- 2. Percent Impervious taken from Placer County, Storm Water Management Manual (SWMM), Table 5-4 "Snow Covered Areas" Elevation 6,500 feet East = 90%
- 3. Infiltration Rates taken from Placer County, Storm Water Management Manual (SWMM), Table 5-3, for Hydrologic Soil Groups with Good Woodland- Coniferous Cover (A = 0.53, B = 0.26, C = 0.15, D = 0.11) and Streets and Roads (A = 0.07, B = 0.06).